

(counted as 9, 10, and 12 on three heads), fertile; disk-corollas yellow, about 4.3–4.7 mm. long, with short lobes, fertile, counted on three heads as 7, 13, and 14; style-appendages about 0.8 mm. long, narrowly lance-triangular, twice as long as the stigmatic portion of the branches; pappus of about 30 markedly unequal white bristles.

Type. Crevices of granite rocks in open yellow pine forest, altitude 8200 feet, Tres Piedras, Taos County, New Mexico, July 8, 1950, *Ripley* and *Barneby 10316*; just coming into bloom (State College of Washington Herbarium No. 155825).

The affinities of this species are obscure. *Haplopappus microcephalus* bears a strong habitual resemblance to *Petradoria*, but the heads are obviously quite different, and it lacks the technical characters by which that closely allied genus is distinguished from *Haplopappus* (vertically aligned phyllaries, sterile disk-flowers). There is also some resemblance, both habitally and technically, to *H. acaulis*, but that species, as well as the whole section to which it belongs, has solitary, much more numerous flowered heads. In Hall's monograph, *H. microcephalus* would key to the section *Hesperodoria*, and it might indeed be possible to see a distant relationship with *H. scopulorum* of that section, but the obtuse phyllaries, discoid heads, and definitely shrubby habit of that species preclude the assumption of any close relationship. I know of no other possible close allies of the new species, which is here confidently proposed.

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## REVIEW

*Maize in the Great Herbals.* By JOHN J. FINAN with a foreword by Edgar Anderson. Chronica Botanica Co., Waltham, Mass. xvi + 149–191 pp. \$3.00 (San Francisco dealer: J. W. Stacey, Inc.)

This work, first published in the *Annals of the Missouri Botanical Garden* (35: 149–191, 1948), has now been reprinted in a handsomely-bound limited edition with a foreword by Edgar Anderson. By bringing together in a compact form the many scattered references to maize in the writings of the early explorers and the herbalists, Mr. Finan has performed an invaluable service to those interested in maize itself as well as to those interested in the history and origin of crop plants. It is fortunate that one of the very few large collections of herbals in this country is located at a center of active research in maize, the Missouri Botanical Garden. Due to this happy circumstance and to the cooperation of experts in modern and classic languages and in art history, Mr. Finan has produced a critical and well annotated account of the early history of maize.

The first section is an account of maize in America in the period just after the conquest, pieced together from many, but by no means all, of the accounts of the early explorers. While there is a surprisingly large amount of material available on the importance and uses of maize in Indian economy, there is a curious lack of information on the different forms and varieties grown throughout North and South America. On the other hand, the herbalists gave detailed descriptions of the plant supplemented by woodcuts, from which it is possible to obtain a fair idea of the varieties grown in Europe subsequent to the conquest. However, in spite of its novelty, maize was first described in the herbal of Bock (1539), some forty years after the discovery of the New World and its possible introduction into Europe. Furthermore, it was not until thirty years later that its American origin was recognized by the herbalists. As in the case of so many American plants of the time, its place of origin was thought to be India or Turkey.

By a careful study of the texts and particularly of the illustrations, Finan has discovered that the maize plants described by the early herbalists resemble northern flint varieties, which are now found in Eastern North America. Lobelius (1576) was the first to describe a second type with numerous prop roots at the lower nodes. He called this second type Indian corn to distinguish it from the earlier-described Turkish-Corn, which did not have the conspicuous prop roots. Tropical varieties characteristically develop such prop roots when moved to high latitudes. Thus, the second variety could very well have come from tropical America. However, the origin of the first type still remains a puzzle. The herbalists considered it to be of oriental origin. Finan suggests two possibilities: first, it may have been introduced into Europe from eastern North America by early English or still earlier Norse explorers, or secondly, it may have been a Caribbean variety that does not develop the characteristic prop roots. As yet no such Caribbean variety has been discovered. Thus another puzzle has been added to the many already existing concerning the origin and distribution of this important food crop.

The value of this volume is considerably enhanced by tables of names, places of origin and kernel colors recorded in the herbals. In particular, there is an extended discussion of the woodcuts used as illustrations together with a table showing which are originals and which are copies. JAMES A. JENKINS, Division of Genetics, University of California, Berkeley.